# POLAR PROBABILITIES OF 1894.

BY BRIGADIER-GENERAL A. W. GREELY, CHIEF SIGNAL OFFICER U. S. A.

---

ON OCTOBER 27, 1876, there anchored at Queenstown Her Majesty's ship "Alert," its sides of oak scarred by many an ice-floe and its heart of oak sore at the unpropitious end of its polar quest; for under the Irish Sea and across the fields of England flashed to the British Admiralty a brief message declaring that the "pole was impracticable." This outcome of an expedition formed of the flower of the Royal Navy, organized under the auspices of Arctic experts and equipped with a lavishness hitherto unknown, gave rise to a widespread belief that the days of polar explorations were past, and that the dreadful waste of human energy and life in the Arctic regions had ceased, unless, as in whaling cruises, there was heard "the jingling of the guinea which helps the hurt that honor feels."

The restless energy and unbounded ambition of the English-speaking peoples were factors not taken into consideration by these prophets of inaction and acquiescence, for no sooner is a fortune acquired or leisure obtained than time and money are given without stint to find a missionary in the wilds of Africa, to determine the currents of mid-ocean, to deport almost an entire oppressed nation to new climes, or to such other scheme, quixotic or practical, as appeals to the modern Crœsus.

In Arctic as in other labors failure oft stimulates to success, and the British expedition of 1876 furnished in its mail-tender, the "Pandora," a ship for the next North-Polar voyage, which, rechristened as the "Jeannette," carried the fortunes of De Long and his brave comrades. In later years Arctic expeditions have been so common as to excite only local comment, and there are

not half a dozen men in this country who can name two out of three of the many voyages of the last fifteen years.

It is not inappropriate, then, that the three important expeditions of this year should be briefly discussed, since all three have for their end and aim the attainment of the farthest north—the reaching of the North Pole. Over what route and by what means these explorers hope to pass the unequalled northing made by Lockwood, of my own expedition, will now be considered. These voyages are not only made under the auspices of three different nations, but follow three widely-separated routes in their lines of operation. Dr. Fridtjof Nansen, the Norwegian, goes by the New Siberian Islands or the Asiatic route; Mr. C. R. Jackson, the Englishman, by Franz Josef Land, or the European pathway; while our own countryman, the gallant and successful Peary, continues in the distinctively American route, through Baffin Bay, with the west coast of Greenland as his base of supplies.

Nansen's project has undergone material modifications since it was made public in 1891. In brief, it contemplates, as its author says, the utilization of nature's forces, by means of a drift voyage with the main ice-pack of the Siberian Ocean across, or in the neighborhood of, the pole. Its ultimate success depends on the absolute correctness of Nansen's conjecture that a constant current sets from Bering Sea across the polar ocean to the north of Franz Josef Land, whence it turns southward between Spitzbergen and Greenland. Nansen originally proposed to follow De Long's route through Bering Sea, thence along the north coast of Asia to the neighborhood of the New Siberian Islands, when, boldly pushing his vessel into the middle of the polar pack, he expects, in the course of three or four years, to drift across the pole to Greenland. He has, however, changed his itinerary, and, in his voyage to the New Siberian Islands, has followed the route made famous by Nordenskiold in his circumnavigation of Asia, through the seas of Barent and Kara and around Cape Cheliuskin, the northernmost point of Asia. The means and methods as announced by Nansen are as follows:

"1. To build a strong ship, so strong that it can withstand the pressure of the ice, and, living in this ship, to float across (or near the pole) with the ice-pack. Or, 2d, to take only boats along and camp on the ice floes and live there while floating across."

Both methods are to be followed. His ship "Fram,"

just large enough to carry provisions and fuel for twelve men for five or six years, is to be supplemented by two peculiar flat-bottomed, decked boats, in which the crew will be housed during their journey of two or three years, in case the "Fram" is lost.

At an Arctic meeting of the Royal Geographical Society in November, 1892, Nansen set forth his plan in detail, and it was discussed by the leading polar commanders of Great Britain, including McClintock, Nares, Inglefield, Young, Richards and Hooker. While admiring the courage of Nansen, not one of these experienced officers commended his plan. Melville views it with marked disfavor, and no word of commendation has been made by Nordenskiold, Koldewey, Payer, Holm or Hovgaard.

Admiral Sir Leopold McClintock, the famous Arctic traveller, does not conceal his fears as to the great dangers to which Nansen proposes to expose himself, and considers that under any pressure by the ice during the winter months the probability of the vessel's sliding up on the ice is very remote. He points out that Nansen's boats are too large and will be difficult to handle among the polar floes, which frequently rush against each other without warning, so that ice which is safe at one moment may in half an hour be extremely dangerous.

While complimenting his pluck, Sir George Nares shows that Nansen disregards every adopted axiom of successful navigation of the polar regions, and deliberately intrusts himself to a perilous drift with the natural movements of the polar ice; this, too, solely on a hypothetical idea of ocean currents concerning which nothing is definitely known. Apart from the well-known danger of besetment by the polar pack, Nares questions gravely the direction of the drift, and he quotes from De Long to show that the only currents experienced by the "Jeannette" in this very region were those caused by the prevailing wind.

Sir Allen Young believes there is land in nearly every direction near the pole, and considers it extremely dangerous for a ship to drift with the pack, since it might impinge on land, and be kept for years, in which case he fully agrees with McClintock that Nansen's large boats would not be manageable, in case of disaster, for retreat to open water. Admiral Sir George Richards speaks most uncompromisingly against the project, saying that any one speaking with authority ought to speak out when so much was at

stake. Sir Joseph Hooker, from his Antarctic service, believes that no ship of whatever build could long resist destruction if committed to the moving ice pack. If thrown upon a new coast, he thought that the enfeebled and probably reduced ship's company would have no prospect of safe retreat. Hooker points out the possibility of scurvy, the depressing influence upon the crew which must result from long confinement in close quarters during many months of darkness, extreme cold, inaction, ennui, constant peril, and from harassing doubts as to the future. While not considering the journey impossible, he considers it impracticable.

Nansen believes that his vessel is so strong and is constructed on such lines that it can scarcely be crushed by the ice if properly handled, but that, under all circumstances, under pressure of the polar pack, the ship will simply be lifted out by the ice. No non-professional man can properly criticise Nansen's ideas as to his ice-proof ship, the "Fram," but fortunately two men of extended Arctic experience have spoken clearly on this point. They are Admiral Sir George Nares, whose works on seamanship are authority in Great Britain, and Chief Engineer George W. Melville, whose abilities have contributed so largely to the late splendid successes of our navy, as exemplified in its magnificent ships. Nares points out that when once frozen in the polar pack, the form of the vessel goes for nothing, and that there is no record of a vessel frozen in the polar pack having been disconnected from the ice so as to be capable of rising under pressure as a separate body detached from the ice-floe, even in the height of summer.

In 1884, Melville, commenting on criticisms from non-experts as to the shape, strength and material of a perfect Arctic ship, wrote as follows :

**"Suppose a ship constructed in the shape of a parabolic spindle, its greatest transverse diameter thirty feet, its length two hundred feet. This would give a body of fine lines, good rising power if nipped below its greatest diameter, and for speed and strength be an acknowledged model. Now build this spindle solid of buoyant material, hooping it like a mast with iron or steel bands, so arranged with reference to weight that the spindle will float like ice, one-eighth part above water. Yet even this pattern of strength would be an egg-shell in the power of the mighty masses of ice, never at rest, but always grinding, like the everlasting gods, . . . even the granite hills and islands."**

The experiences of previous expeditions indicate clearly the probabilities of success in Nansen's drift journey.

McClintock, in his *Voyage of the Fox,* when his ship was beset in Baffin Bay, records: "Feb. 15, 1858. Daylight reveals evidences of vast ice movements during the dark months when we fancied all was quiet; and we now see how greatly we have been favored, what innumerable chances of destruction we have unconsciously escaped." He describes on two occasions ice disruptions near the "Fox" on calm nights, when the actions and sounds of the uprising polar pack were appalling. In speaking of ice movements, March 18, he adds: "No one in his senses could avoid reflecting upon the inevitable fate of a ship if exposed to such fearful pressure." Elsewhere, he "can understand how men's hair has turned gray in a few hours"; and, despite boats and sledges ready for use, states: "Had our vessel been destroyed after the ice broke up, there remained no hope for us."

The "Polaris," in Smith Sound, according to the official narrative, "was raised up bodily and thrown over on her port side," "the great floe itself (to which the 'Polaris' had been anchored for two months) had cracked in several places," and later disrupted so suddenly that nineteen men were cut off from the ship and never regained it. The eventful drift-voyage of thirteen hundred miles, under Captain Tyson, indicates the coming experiences of Nansen, save that the Norwegian has four to five months of continuous darkness to endure. In the "Polaris" ice-drift there is constant reference in the official narrative to the anxiety and danger from ice disruption. To emphasize the suddenness of such movements of the polar pack, and the impossibility of foreseeing or guarding against the separation of the party, reference is made to April 5, 1873, when before daylight the main floe broke into four pieces, one piece carrying away one of the huts so suddenly that the inmates barely escaped with only a part of their effects. The next day, fortunately in daylight, the floe again split with a great noise, cutting the hunter's hut in two. At midnight of March 8, the floe broke between the tent and boat, which were so close together that there was not space to walk between them. Had the break been a few feet to one side the entire tent party would have fallen into the sea, but as it was, the kayak, the boat, and their astronomer were carried away, and it almost seemed an intervention of Divine Providence that, after seven hours of terrible effort, they rescued the frozen and nearly dead comrade and the boats on which the lives of the

whole party depended. The mental condition of these hardy men is clearly set forth :

"For those who attempted to rest the body there was no repose for the mind. One after another would spring up from his sleeping-bag and make a wild dash forward, as if to avoid some sudden danger."

The experiences of the Lady Franklin Bay Expedition on September 28, 1883, when drifting *a la Nansen*, is reproduced from my notes :

"The gale increased in violence, causing such conflict between the heavy floes as it is beyond the power of language to describe. Our own floe was from forty to fifty feet in thickness, and yet it tumbled and cracked like chalk under the tremendous pressure of the surrounding floes. As the edges of these immense masses of ice ground against each other, with terrible groaning and almost irresistible force, their margins were covered for several rods with thousands of tons of broken ice. . . . Just as the whaleboat party quitted their snow-house a shock of unusual violence split our floe again, and a wide crack, running through the abandoned house, speedily swallowed up a portion of it. Even as we rapidly rolled up the tepee, a narrow crack formed under our feet."

Fortunately, it was daylight, and the jam of paleocrystic floes continued long enough to permit the bold men to rush boats, sledges and baggage in desperation across an unstable bridge of small rubble ice, held together by pressure, which opened as the last man passed and nearly dropped him into the sea.

It is unnecessary to quote from Back's experiences in the "Terror;" of Koldewey, first in the "Hansa," and, after she was crushed, in boats off the east coast of Greenland ; of Weyprecht in the "Tegethoff," or of De Long in the "Jeannette ;" they all testify to the tremendous force of the disruption of the main ice-pack, both in storm and in perfect calm, and concur that no vessel can escape save almost by miracle. It is significant that no vessel ever beset in the main pack of the Siberian ocean has escaped therefrom.

Nansen has against him, as illustrated by the experiences of his predecessors, the certainty that his ship is not ice proof ; the impractibility of handling his large boats when his ship sinks ; the possibility of the polar pack suddenly disrupting and separating the party and its materials ; the probability that in three years disease or accident will break down his party physically,

and the almost absolute certainty that the Arctic night, with its unbroken darkness of four to five months and its accompanying life of monotony, inactivity, cold, limited quarters and restricted diet, will impair the mental and moral energies of his men.

Assuming, as is fairly probable, that the general direction of the ice-drift is correctly surmised by Nansen, yet it is largely dominated by the wind. The prevailing winds depend entirely on the relative distribution of atmospheric pressures, and while the polar pressures are comparatively constant, yet they are liable to extraordinary changes from year to year, thus introducing an element of great uncertainty in the most important factor of Nansen's success, the direction of the drift.

In my opinion the scheme is unwise, impracticable and is little short of suicidal. If an almost miraculous escape, similar to that of the "Polaris" drift-party, spares these daring and determined men it will in no wise prove its wisdom or advisability.

The objects in view by Mr. Jackson in his polar expedition to Franz Josef Land and towards the North Pole are summarized by him under two heads as follows:

**"1. The general exploration of Franz Josef Land, and, in particular, the discovery and mapping of its northern regions; the observation of the climatic conditions encountered; the recording of such geological evidence as is met with, and the general investigation of the geological conditions of the country.**

**"2. An advance in a northerly direction which shall be so far continued as to bring me within the immediate locality of the North Pole, and an endeavor, by all means in my power, to observe the geographical conditions at that mathematical point."**

The route followed by Jackson presents the most promising field for reaching either the North Pole or a very high latitude. Franz Josef Land was discovered by Weyprecht and Payer in 1873–4, during the voyage of the "Teghetoff," which ship, beset within two days of its starting, drifted northeastward to the new land, on the shores of which it was abandoned by the crew, who safely returned by way of Nova Zembla. Apart from the besetment of his ship, Payer considered this land the true route to the pole, as well he might, since with a small party he reached latitude 82° 05′ N., a latitude exceeded on land only by Meyer in 1871, by Aldrich in 1876 and by Lockwood in 1882. Payer's most northerly point was 124 geographical miles to the northward of his ship.

It remained for a gallant and adventurous Englishman, Mr. Leigh Smith, to extend very considerably the limits of Franz Josef Land, to prove its easy accessibility and demonstrate its fitness as the true route to the North Pole. Smith avoided the main ice-pack of Barent Sea, and skirting its western limit easily reached the western shores of this land and in latitude 80° N., longitude 48° E., discovered a safe harbor named Eira, after his ship; during this and later voyages he made such extensive discoveries that his name has been fittingly placed upon this new coast. In one voyage, losing his ship by an unfortunate accident, Smith wintered at Eira harbor, where game proved sufficiently abundant to supply his party with meat.

Jackson intends landing at Eira Harbor, or at the most northerly suitable and accessible point on the west coast of Leigh Smith Land. His main party will consist of ten men, and the northward journey will be made by dog sledges as far as possible, and, when land fails, by whale boats. It is expected that the main journey will be made during the summer of 1894, and that Mr. Jackson will return in no event later than 1895 with such results as will prove whether the pole is practicable or not by the way of Franz Josef Land. Detailed information is wanting as to Jackson's equipment for field travel—a most important matter, since its lightness and fitness always forms an important factor in the success of Arctic exploration. The English explorer, however, while working quietly and modestly, has apparently considered his journey in all its bearings, and it is probable that his party has been well selected and has been equipped with the most modern and most approved methods; in which case there will be good reason to expect from Jackson's efforts quite extensive additions to our knowledge of Arctic lands, and possibly the attainment of an unprecedentedly high latitude.

The extraordinary journey of Robert E. Peary, civil engineer in the United States Navy, across the inland ice of Greenland, had made this young officer famous and his name known to every intelligent American. His second journey, on practically the same lines and over the same route as in 1891, has excited very general interest, especially as he is the third explorer now striving for the honors of the farthest north. His base of operations will be Inglefield Gulf, on the west coast of Greenland, 77.5° north

latitude, 71° west longitude. The outlines of Peary's plans are derived from Mr. Cyrus C. Adams, one of the leading geographers of the country, who has taken a lively interest in the organization and success of the expedition. The dog teams of previous years will be supplemented by donkeys as pack animals, and with these motors Peary will travel across the ice-cap direct from his home station to Independence Bay, 81° 35' N., 33° W., with five or six men. Half of the party will then return southward and, tracing the eastern edge of the inland ice to the vicinity of Cape Bismarck, regain Inglefield Gulf by the easiest route. Peary will turn northwards to explore the archipelago discovered by Lockwood, and, if necessary, he contemplates wintering at Independence Bay, living in stone or snow huts and subsisting on the game of the country—musk-oxen, hares and seals. It is not denied that both Peary's observations and Lockwood's explorations far to the northwest prove that the archipelago is not ice clad, and it is frankly admitted that as travel beyond Independence Bay must be by sledge along shore, unfavorable conditions of coast and ice would make the advance journey arduous and dangerous. The possible extension of Peary's work towards the pole is touched on, and the admission made that should the polar pack be favorable it is not improbable that the land will be left for a sea journey.

The exact object in view must be known to intelligently forecast or determine the degree of success of his expedition. This difficulty which presents itself in passing upon the success of Peary's first expedition still exists. On April 4, 1891, under his own hand Peary wrote to the National Geographical Society: "The advance party will push on . . . to the head of De Long Fiord, establish a depot, thence to the northern terminus of Greenland." He did not reach De Long Fiord or come within 70 miles of it, and the northern terminus of Greenland instead of being to the north of De Long Fiord was found to be where I placed it in 1882, near the 82d parallel.

The following letter of April, 1891, forecast that journey and it applies equally to the present voyage:

"I have no doubt that you will be able to make a remarkable journey on the inland ice. I have no faith, however, in your being able to go beyond either Sherard Osborn Fiord or possibly Victoria or Nordenskiold inlet.

There is the strongest possible circumstantial evidence to prove that one of these fiords separates the northern part of Greenland, and you will look in vain in any of the reports of Arctic travellers for indications of the inland ice to the northward of the eighty-first degree. Doubtless the ice does extend further north in the interior of Greenland, and in such case you would reach the northern extremity of it and doubtless be able to skirt it.

"It seems to me it would be worth your while rather to reach the vicinity of the east Greenland coast to the north of Cape Bismarck. There is no doubt the farther north you go the better chances you would have for travelling over good snow."

There are not ten men in the country, including Peary's entire party, who can to-day, without consulting Peary's account in the New York *Sun*, describe as accurately what Peary did as I foretold prior to the journey. While Peary failed in his ultimate object, yet his journey across Greenland to Independence Bay was a magnificent piece of work, which fully justified Melville's confidence in glacier travelling set forth in 1884, and my own view given in the above-mentioned letter.

In my opinion the party will trace the inland ice southward from Independence Bay to the vicinity of Cape Bismarck, but I do not believe it will ever travel one hundred miles to the northeastward of Independence Bay.

The inland ice and Peary's travelling outfit are like the smooth roads of Central Park and the light carriages used therein, but when the wretched, heavy roads of winter are reached in the open country heavy wagons are needful, so the distorted icefoot and broken floes of the polar seas demand special sledges. Listen to Peary's own description of a twelve miles' journey without baggage after leaving the icefoot:

"My feet were on the sharp chaos-strewn rocks which cover the icefoot borders of this land of rock. . . . My mountains seemed to recede as I advanced, and it was eight hours before I reached the summit. . . . I was strongly tempted to go on, but my foot-gear precluded it; the soles of both kamiks (mocassins) were cut through and the edges of sharp rocks had cut my feet. It was even questionable whether I could fix up my foot-gear in order to get back without serious injury to my feet."

Obliged to use his sealskin mittens, his cap and part of his garments to protect his feet, he speaks of the excruciating pain which marked this journey of twenty-four miles in thirteen hours. As to the reserve powers for a longer journey, it need only be said that of sixteen dogs only four returned to Whale Sound. It thus seems impossible to accumulate stores at Inde-

pendence Bay, and a winter camp with its hundred and forty days of continuous darkness, appears little short of madness to a party expecting to live on the scanty and migratory game of the country.

In his sketch map (New York *Sun*, October 31, 1892) Peary extends the northern coast of Independence Bay some fifty miles eastward, to about 25° west longitude. This easterly extension of bold, high, ice-free land, with intervening water, whereon the ice was in the process of disintegration, makes it exceedingly doubtful if a very high northing can be made on that coast, with Inglefield gulf as a base.

The endurance, determination and skill of Lieutenant Peary are beyond question and his moderate success most probable, but as to his attaining the farthest north and mapping out the north-eastern boundaries of the archipelago discovered by Lockwood his chances of success are inconsiderable, say one in ten. In any event we bid God-speed and wish entire success to the hardy, adventurous American who, having once beaten the Norwegian on his chosen ground over the inland ice of Greenland, now strives to outstrip the persistent Nansen in a race for the Pole.

A. W. GREELY.